STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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November 8, 1985

Mr. Mel Swanson
Chief Engineer
Kelmine Corporation
P. O. Box 1383
Moab, Utah 84532

Dear Mr. Swanson:

RE: Initial Review of Mining and Reclamation Plan, Lisbon Valley Copper Mine and Mill, PRO/037/032, San Juan County, Utah

The Division of Oil, Gas and Mining (DOGM) has completed its review of the Mining and Reclamation Plan (MRP) for the above-referenced mine. The comments are delineated by regulation.

Rule M-3(2)(a)(b) Land Use - KMM

The applicant states that winter livestock use is the prior, current and future land use of the permit area. The applicant should address wildlife use of the area including any critical habitats or species of special concern, e.g., raptors, threatened or endangered species.

Rule M-3(2)(e) Planting Program - KMM

1. The applicant describes a revegetation plan which will be tested on the Phase I tails dump starting 2 to 2-1/2 years after plant start-up. The test area is described as only one treatment which lacks topsoil (or soil substitute), ripping or discing to prepare the seedbed, seed covering and mulch. The only seedbed preparation proposed is walking the area with a crawler tractor before seeding.

In order to evaluate the techniques which will eventually be used to revegetate the entire site, the applicant should include various conditions (e.g., slope, topsoil, surface ripping, etc.) and treatments (mulch, seed mixes, etc.) on their test area. The applicant should describe how the test area will be monitored and how this information will be used to develop a final reclamation plan. See discussions of Rule M-3(2)(f) for scheduling problems.

2. The applicant must propose interim vegetation to stabilize topsoil stockpiles to both control erosion and increase fertility of the materials. Both the proposed and existing stockpiles should be treated.

3. Slopes of the haul road fill area should be revegetated during the first favorable period (fall or spring) after construction. Since the haul road fill will be comparable in material and slope to the proposed Phase II mine waste pile, the fill area may be valuable as a test plot. Early revegetation of the haul road slopes could provide a year or more additional data for consideration.

4. Postmining haul road reclamation includes "ripping and recontouring." The applicant should indicate whether this means to approximate original contour, to reestablish the original drainage or to what other extent.

   Unless a variance is granted, road reclamation will require more than ripping considering that two feet of sandstone material is proposed for use as road base.

5. Ripping to relieve compaction should also be considered for all mill site areas.

6. The applicant intends to strip vegetation from the area before stockpiling topsoil. The applicant should consider stripping vegetation with topsoil to save construction time and to provide organic matter to the topsoil material. Stripping trees with soil should only be considered if the equipment being used is capable of crushing/grinding the trees to reasonable

size. Any addition of organic matter should aid revegetation in the "blow sand" and clay soils especially if mulch is not used.

7. Thirteen pounds per acre might be suitable for drill seeding but is too light a rate for broadcasting. Fourwing salt grass is not known to the Division. The applicant should submit additional information for evaluating suitability of the seed mix for the postmining land-use. The Division recommends a more diverse mix including, for example, giant dropseed (Sporobolus gigateus), alkali sacaton (Sporobolus airoides), Palmer penstemon (Penstemon palmeri), or fourwing saltbush (Atriplex canescens) and the substitution of western wheatgrass (Agropyron smithii) for crest wheatgrass (Agropyron cristatum).

Rule M-3(2)(f) Reclamation Schedule - KMM

1. The applicant provides a general time line of construction and reclamation activities and a summary of construction time for surety calculations. It appears that Phase II leach pad reclamation will begin when the Phase I test plot is only in its second year. Without more extensive treatments in the test program, the applicant will have very little data available to guide Phase II reclamation.

2. Contemporaneous grading and reclamation of the waste pile is proposed as 10a are complete. This reclamation should be indicated in the Construction and Reclamation Schedule and should include the entire 19.6 acres of Phase I waste.

3. Dozer tracking is a valuable method of creating "mine water bars" during reclamation, but should be done with the tractor working up and down the slope. Tracking should be done immediately after seeding to establish good contact between seed and soil.

4. The life of mine and reclamation period is not consistently described throughout the permit, e.g., #17 says 9-10 years, page 18 says 15.5 years. Life of mine in years is not clear in the Construction and Reclamation Schedule. The schedule should include vegetation monitoring for bond release.

Rule M-3(5)(c) - RVS

The operator must commit to plugging exploration boreholes with at least five feet of cement at the surface.

Rule M-3(e) - Initial Development - TM

The applicant must show all proposed diversions and recontouring in the area of leach pads and tailings stockpiles to divert existing drainage away from proposed leach pads and tailings stockpiles. Due to the current erosive nature of these soils and present existence of large gullies, the applicant must show what consideration is going to be given to prevent this drainage from effecting the proposed placement of the leach pads.

The applicant must also show the size of all proposed diversions in cross sections and calculate expected velocities using Mannings' equation or a similar technique. Protection measures must be discussed in areas where velocities exceed five feet per second and at points where diverted flows enter undisturbed drainages. The inputs to these calculations must be included in the plan.

Rule M-3(h) - TM

The applicant must discuss what will happen to any leachate generated when the leach piles are neutralized by the barren water-milk of lime solution. How will any leachate generated by this process be disposed of?

Rule M-5 - PGL

The surety calculations on page 82 will need to be revised to reflect Division costs to perform the reclamation. The Division references for reclamation costs are the Rental Rate Bluebook and the Means Site Work Index.

Rule M-10(1) Land Use - KMM

See comments under Rule M-3(2)(e), #7.

Rule M-10(2)(d) - PGL

Where will the warning signs be located and how long will they be maintained?

Rule M-10(4) - TM and EH

The use of graded slopes for the waste dump and leach tails both during operation and reclamation has been mentioned on page 79 as a preventative measure against erosion. The use of large, 12 inch, rocks mixed with fines on the slopes has also been mentioned as a measure to prevent erosion. It is the Division's opinion that the second method of using 12 inch plus rocks mixed with fines is not an acceptable method of preventing erosion. It seems that the fines would tend to wash out around these rocks and create erosion. It is not explained how this will prevent erosion in the long-term.

The mine plan presents conflicting information on the final configuration of the leach tailing slopes. The site development Map "A" and page 80 indicates a 2:1, whereas page 79 states the final grade will be a 3:1 slope. This discrepancy must be cleared up.

Rule M-10(5) - PGL

The reclamation of the highwalls in the pit has not been addressed. The pit should be backfilled with waste rock and leached tailings. In particular, the highwall along the southwest side of the pit will be composed of Mancos shale, and as currently designed, will be 175 feet high at the conclusion of mining, a potentially unstable situation. Please address the reclamation of all of the pit highwalls.

Rule M-10(6) - EH

The applicant must submit:

1. Monitoring plans for the heap leach pads and tailing that will ensure that all excess acid is consumed by the lime solution.

2. Methods of disposal of the amonium sulfate produced that is over and above that used as a fertilizer on the leached tailings.

3. A discussion on the tests used to determine the amount of lime required to bring the pH up to 7.0 in the leached tails.

4. The site and size of the sulfide ore secondary leach pad.

5. The chemical make up of the processes ponds at the time of reclamation.

6. A more complete discussion of the methods used to neutralize the processes ponds.

Rule M-10(7) - PGL

The exact delineation of responsibility by San Juan County road maintenance must be shown. Will any sections of road be reclaimed after mining?

Rule M-10(8) - TM

The applicant must discuss the removal of the proposed 48 inch culvert and associated road following mining, so that no drainage structures, sediment or flood control structures, spoil, ore, waste, fill material and debris are left in natural channels or flood plains before the applicant abandons the site.

Rule M-10(9) - PGL

What will be the disposition of structures and equipment after mining? The cost estimate does not detail this. Will foundations be broken up and buried? The cost should be included in the cost estimate.

Rule M-10(12) Revegetation - KMM

(2) Applicant should submit the methodology for determining vegetation cover "using professionally accepted inventory methods" and the location of sample areas or reference areas which will be used for establishing a revegetation success standard.

Cover values of vegetation should not be relative but should reflect ground cover totaling 100 percent when bare ground, litter, rock moss, etc., are included. The applicant currently indicates 100 percent cover of trees in the pinyon vegetation type and 95 percent cover in the sage-grassland type. Revegetation success will be evaluated on achieving 70 percent of the cover of representative communities.

Rule M-10(14) - EH

The applicant must submit:

1. Plans for removal and storage of topsoil from all areas of disturbance including the leach pad area.

   In all areas that a variance from topsoil removed is requested, the justification for not removing topsoil must be submitted.

2. Protection measures for the topsoil stockpiles must include a plan for seeding.

3. The depth of topsoil to be replaced on the process ponds and associated areas.

4. A discussion on the tests used to determine the acid consumption potential of the soils.

Please contact me or John Whitehead of my staff if you should have any questions or need to meet with us on this matter.

Sincerely,

Lowell P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

JJW/btb
cc: Terry McFarland, BLM
Charles Deits, DOH
Technical Review Team
9294R-32-38